

CLAIMS

1. A polypeptide which has amylase activity and has an amino acid sequence which comprises:

- a) a catalytic core sequence encoded by a DNA sequence present in a plasmid in *E. coli* DSM 16113 or in *Valsaria rubricosa* CBS 848.96,
- b) a sequence as shown in positions 1-439 of SEQ ID NO 2 or 19;
- c) a sequence which has at least 70 % identity to the sequence defined in (a) or (b), or
- d) a sequence encoded by a nucleic acid sequence which hybridizes at 55 °C with the complementary strand of nucleotides 146-1462 of SEQ ID NO: 1 or nucleotides 76-1392 of SEQ ID NO: 18.

2. The polypeptide of claim 1 wherein the amino acid sequence further comprises a carbohydrate-binding domain.

3. The polypeptide of claim 1 or 2 which has an amino acid sequence comprising:

- a) a catalytic core sequence and carbohydrate-binding module which are encoded by a DNA sequence present in a plasmid in *E. coli* DSM 16113
- b) a sequence as shown in positions 1-566 of SEQ ID NO 2 or 19;
- c) a sequence which has at least 70 % identity to the sequence defined in (a) or (b),
- d) a sequence encoded by a nucleic acid sequence which hybridizes at 55 °C with the complementary strand of nucleotides 146-1843 of SEQ ID NO: 1 or nucleotides 76-1392 of SEQ ID NO: 18.

4. A polypeptide which has an amino acid sequence comprising a carbohydrate-binding module having at least 70 % identity to amino acids 440-566 of SEQ ID NO: 2 or 19.

5. A polynucleotide comprising a sequence which encodes the polypeptide of any of claims 1-5.

6. A polynucleotide comprising a sequence which is:

- a) a DNA sequence present in a plasmid in *E. coli* DSM 16113 or in *Valsaria rubricosa* CBS 848.96, which encodes an amylase catalytic core;
- b) a sequence which has at least 70 % identity to nucleotides 146-1462 of SEQ ID NO: 1 or nucleotides 76-1392 of SEQ ID NO: 18 and encodes an amylase catalytic core;
- c) a nucleic acid sequence which hybridizes at 55°C with the complementary strand of nucleotides 146-1462 of SEQ ID NO: 1 or nucleotides 76-1392 of SEQ ID NO: 18; or

d) the complementary strand of the polynucleotide of a), b), or c).

7. A polynucleotide comprising a sequence which is:

a) a DNA sequence present in a plasmid in *E. coli* DSM 16113 or in *Valsaria rubricosa* CBS 848.96, which encodes an amylase catalytic core and a carbohydrate binding domain;

5 b) a sequence which has at least 70 % identity to nucleotides 146-1843 of SEQ ID NO: 1 or nucleotides 76-1773 of SEQ ID NO: 18 and encodes an amylase catalytic core and a carbohydrate binding domain;

c) a nucleic acid sequence which hybridizes at 55°C with the complementary strand of nucleotides 146-1843 of SEQ ID NO: 1 or nucleotides 76-1773 of SEQ ID NO: 18; or

10 d) the complementary strand of the polynucleotide of a), b), or c).

8. A vector comprising the polynucleotide of any of claims 5-7 operably linked to one or more control sequences that direct the production of the polypeptide in a suitable host.

9. A transformed host cell comprising the vector of the preceding claim.

10. A method for producing an amylase, which comprises

15 a) cultivating the host cell of the preceding claim under conditions appropriate for expression of amylase, and

b) recovering the amylase.

11. A dough composition which comprises flour and the polypeptide of any of claims 1-4.

20 12. A process for preparing a dough-based product, comprising adding the polypeptide of any of claims 1-4 to a dough, leavening, and heating the dough.

13. The process of the preceding claim which further comprises adding an exo-acting amylase to the dough.

14. The process of the preceding claim wherein the exo-acting amylase is a maltogenic alpha-amylase.

25 15. A process for preparing a dough-based product, comprising adding a first and a second amylase to a dough, leavening, and heating the dough, wherein:

a) the first amylase retains more than 50% activity after 15 min incubation at 62°C in 50 mM sodium acetate, 1 mM CaCl₂, pH 5.7, and has an amino acid sequence comprising a catalytic module and carbohydrate-binding module, and

30 b) the second amylase is an exo-acting amylase.

16. The process of the preceding claim wherein the first amylase is derived from a fungus.

17. The process of any of claims 15 or 16 wherein the second amylase is a maltogenic alpha-amylase.